

**Amendments to the Claims**

1. (currently amended) A computerized method of identifying potentially fraudulent healthcare reimbursement claims, comprising:
  - 5 determining a sequence of healthcare states, wherein a healthcare state is any of, but not limited to a provider and a facility, for a client from healthcare reimbursement claims associated with the client by segregating by entity and for each entity sorting by date, then, responsive to sorting, determining states to be modeled, wherein said states are identified at levels based on a state hierarchy process, and wherein each sequence
  - 10 comprises one or more states and storing said sequence in any of:
    - a data structure in a system database; and
    - in working memory, and
  - 15 calculating a probability of the sequence of healthcare states based on previously calculated probabilities of individual ones of the healthcare states as contained in a model derived from a collection of healthcare data, and based on aggregated sequence probability information from previously processed individual sequence probabilities; and
  - identifying the sequence as potentially fraudulent as a function of the probability of the sequence wherein said probability of sequence is distinct.
- 20 2. (previously presented) The computerized method of claim 1, further comprising:
  - processing healthcare reimbursement claims for a population of clients and healthcare providers for a selected time interval to identify a total set of potential healthcare states; and
  - for each healthcare state, determining a probability of the healthcare state as a function of the frequency of the healthcare state in the reimbursement claims.
- 25 3. (currently amended) A method for identifying potentially fraudulent or abusive treatment practices by healthcare providers, comprising:
  - processing healthcare reimbursement claims for treatments provided by the providers, to determine transition probabilities for sequences of healthcare states for the

treatments, wherein transition probabilities for sequences are determined based on previously calculated probabilities of individual ones of the healthcare states as contained in a model derived from a collection of healthcare data, and wherein said sequences of healthcare states are created by segregating by entity and for each entity

- 5 sorting by date, then, responsive to sorting, determining states to be modeled, wherein said states are identified at levels based on a state hierarchy process, and wherein each sequence comprises one or more states;

for each provider, determining an aggregated transition probability for all sequences of healthcare states for treatments provided by the provider; and

- 10 Identifying as potentially fraudulent at least one provider having aggregated transition probability that is statistically different from the aggregate transition probabilities of similar providers.

4. (previously presented) The method of claim 3, wherein determining an aggregated  
15 transition probability for all sequences of healthcare states for treatment provided by the provider comprises:

for each client treated by a provider, determining a transition probability for each sequence of healthcare states including at least one treatment provided by the provider the client; and

- 20 determining the aggregated transition probability for the provider as a function of the transition probabilities determined for each sequence of each client.

5. (original) The method of claim 4, wherein:

- for each pair of states, there is a transition probability for a transition between the  
25 states; and

the transition probability for a sequence of states is the geometric mean of the transition probabilities between each state and the next state in the sequence.

6. (Cancelled)

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7. (previously presented) The method of Claim 3, wherein processing healthcare reimbursement claims for treatments provided by the providers, further comprises:

for each client in a population of clients, determining a transition probability for each sequence of healthcare states experienced by the client.

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8. (currently amended) A method for creating a model of healthcare states, comprising:

receiving healthcare reimbursement claims from a plurality of healthcare providers, each reimbursement claim related to a client and healthcare treatment;

for each client:

10           extracting from the claims related to the client a plurality of treatments;

determining by segregating by entity and for each entity sorting by date, then, responsive to sorting, determining states to be modeled, wherein said states are identified at levels based on a state hierarchy process at least one sequence of healthcare states from the treatments, wherein each sequence comprises one or more states, and wherein each state is associated with a provider;

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for each pair of states in each sequence, updating a frequency count of a transition from a first state to a next state;

for each state, determining a total count of transitions from the state to all other states based on the frequency counts;

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for each state transition from a first state to a next state, determining a transition probability for the state transition as the ratio of the frequency count from the first state to the next state, to total count of transition for the first state to all other states; and

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after all transition probabilities are determined for each state transition, creating a look-up transition probability table that contains all state transition probabilities for subsequent transition probability in said model.

9. (currently amended) A method of profiling healthcare entities, the method comprising:

30           determining at least one sequence of healthcare states from healthcare reimbursement claims associated with an entity by segregating by entity and for each

entity sorting by date, then, responsive to sorting, determining states to be modeled,  
wherein said states are identified at levels based on a state hierarchy process, wherein  
each sequence comprises one or more states, and[;]] wherein a sequence of  
healthcare states represents client experiences in one or more episodes of care;

- 5       determining a transition probability of each sequence based on previously  
determined transition probabilities of individual ones of the healthcare states[[.]],  
wherein a previously determined transition probability of an individual healthcare state is  
determined using look-up table of Claim 8; and  
assigning to a profile of the entity a transition metric based on the transition  
10 probability of each sequence.

10. (previously presented) The method of any of one of claims 1, 3, 8, or 9, wherein the  
healthcare states are facilities providing procedures to clients.

- 15      11. (previously presented) The method of any of one of claims 1, 3, 8, or 9, wherein the  
healthcare states are services codes for healthcare procedures.

12. (previously presented) The method of any of one of claims 1, 3, 8, or 9, wherein the  
healthcare states are the healthcare providers.

- 20      13. (previously presented) The method of any of one of claims 1, 3, 8, or 9, wherein the  
healthcare states are provider-days.

- 25      14. (previously presented) The method of any of one of claims 1, 3, 8, or 9, wherein the  
healthcare states are provider-service codes.

15. (currently amended) A system for creating models of healthcare claims,  
comprising:

- 30      a database of healthcare claims, each claim including identification of a client, a  
provider, at least one procedure, and a date;

a data processing module that processes a set of the claims into [[a]] date-ordered, entity specific sequences of states by segregating by entity and for each entity sorting by date, then, responsive to sorting, determining states to be modeled, wherein said states are identified at levels based on a state hierarchy process, wherein each

- 5 sequence comprises one or more states, and [I.] wherein a state comprises any of, but not limited to: facilities providing procedures to clients, services codes for healthcare procedures, healthcare providers, provider-days, and provider-service codes;

- 10 a transition processing module that determines, from the date ordered entity specific sequences, a transition metric for each transition between states, wherein said transition metric for each transition between states is based on frequency counts of a transition from a first state to a next state; and

an entity profiling module that generates profiles for at least one entity and a transition metric for one or more sequences of states related to the entity.

- 15 16. (original) The system of claim 15, further comprising:

an analytical module that receives the profiles and identifies entities that are potentially fraudulent or abusive based at least in part upon the transition metrics contained in the profiles.

- 20 17. (original) The system of claim 16, wherein the analytical module includes a predictive model.

18. (original) The system of claim 16, wherein the analytical module includes a rules based model.

- 25 19. (original) The system of claim 15, wherein an entity is one of the group consisting of:

a client;

a healthcare provider;

- 30 a provider/client; or

12/10/2004 FRI 14:55 FAX 650 474 8401 GLENN PATENT GROUP

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a procedure.

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